UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/630,918	08/02/2000	Juliet C. Kraal	200-0646	7908

7590 01/17/2006

Daniel H Bliss
Bliss McGlynn P C
Suite 600
2075 West Big Beaver Road
Troy, MI 48084

EXAMINER	
STEVENS, THOMAS H	
ART UNIT	**PAPER NUMBER**
2123	

DATE MAILED: 01/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/630,918
Filing Date: August 02, 2000
Appellant(s): KRAAL ET AL.

Daniel H. Bliss
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 10/20/05 appealing from the Office action mailed 1/4/05.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

Claims 1-6 have been rejected.

Claims 7 has been cancelled

Claims 8-20 have been rejected.

Claims 1-6 and 8-20 are being appealed.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

No evidence is relied upon by the examiner in the rejection of the claims under appeal.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-6, 8-20 are rejected under 35 U.S.C. 103 (a) as unpatentable by Nayar ("DENEB/ERGO—A Simulation-based Human Factors Tool" (1995)), in view of

Purschke (" Virtual Reality-New Methods for Improving and Accelerating the Development Process in Vehicle Styling and Designing" (1998)).

Nayar teaches an interactive 3D software simulation-based tool for human factors and ergonomic analysis which focuses on various motions, posture (abstract), scaling down (pg. 428, section 1.4, lines 7-8) to accommodate any specific purpose; but doesn't teach using this feature for automotive interior design.

Purschke et al, teaches a series of steps of car development using virtual humans for interior design.

At the time the invention, it would have been obvious to one of ordinary skill in the art to use Purschke et al to modify Nayar since it would have been advantageous to have a scalable virtual human to adjust specific car interior features towards a specific market demographic.

Claim 1. A system for subjective evaluation of a vehicle design within a virtual environment using virtual reality comprising (Purschke: title): a scaleable physical property representative of the vehicle design, wherein the physical property is adjusted according to a scale ratio (Nayar pg. 428, section 1.4, lines 7-8) for an evaluator of the vehicle design wherein the scale ratio is a ratio between a predetermined dimension of the evaluator and a predetermined dimension of a member of a target population (Nayar: pg 482, sections 1.4; and 3; specifically, section 3, right column, 2nd paragraph, last sentence); a computer system for digitally creating a virtual environment having a virtual human immersed within the virtual environment, wherein the virtual environment includes the vehicle design and the virtual human virtually represents a scaled evaluator

(Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1); a motion capture system for sensing a motion (Purschke: pg. 11, lines 26) of the evaluator and communicating the sensed motion of the evaluator to the computer system, so that the motion of the evaluator controls the motion of the virtual human in the virtual environment; and a virtual reality display mechanism operatively communicating with the computer system, for providing the evaluator a view of the virtual environment while evaluating the vehicle design (Purschke: pg.1, Introduction, 3rd paragraph with pg. 9, figure 12; Nayar: figures 1 and 3).

Claim 2. The system of claim 1(Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1) includes an instrumented glove worn by the evaluator for sensing motion of the evaluator's hand (Nayar: pg. 428, section 1.5; and Purschke: pg. 11, line 25).

Claim 3.The system of claim 1(Purschke: title; Nayar pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1) wherein the motion capture system includes magnetic spatial tracking sensors located on the evaluator for sensing motion of the evaluator's full body (Purschke: pg. 11, lines 26).

Claim 4. The system of claim 1(Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1) wherein the virtual reality display mechanism includes a head mounted display mechanism worm by the evaluator for

seeing the virtual environment through an eye of the virtual human (Purschke: pg. 11, lines 26).

Claim 5. The system of claim 1(Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1) wherein the computer system includes at least one video terminal displaying a view of the virtual environment as seen through an eye of the virtual human.

Claim 6. The system of claim 1(Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1) wherein the computer system includes at least one video terminal displaying a third person view of the virtual human immersed within the virtual environment (Nayar: pg. 428, section 1.5 with figure 1 pg. 429).

Claim 8. A method of subjective evaluation of a vehicle design within a virtual environment using virtual reality, said method comprising the steps of: preparing an evaluator of a vehicle design for immersion as a virtual human in the virtual environment (Purschke: pg. 4, section 1.3), wherein the virtual environment is created within a computer system and includes the vehicle design; determining a scale ratio and range of a target population for the evaluator, wherein the scale ratio is a ratio between a predetermined dimension of the evaluator and a predetermined dimension of a member of a the target population (Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1); preparing an adjustable property using the

vehicle design and the scale ratio (Nayar: pg. 428, section 1.4, lines 7-8); vowing the virtual human within the virtual environment to virtual represent a scaled evaluator (Nayar: pg.428, section 3) aligning the virtual human in the virtual environment with the evaluator (Nayar: pg.428, section 3)and the property, performing the evaluation of the vehicle desire by the evaluator; and using the evaluation of the vehicle design in the design of the vehicle (Purschke: pg 9-10, section 3) .

Claim 9. Method as set forth in claim 8 (Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1) wherein said step of preparing an evaluator includes the step of measuring an anthropometric dimension of the evaluator (Purschke: pg. 9, section 3.1 and Nayar: pg. 427, left column, section 1.1, line 10).

Claim 10.A method as set forth in claim 8(Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1) wherein said step of preparing an evaluator includes the step of positioning a motion capture system on the evaluator for sensing a motion of the evaluator (Purschke: pg. 9, section 3.1) and communicating the sensed motion of the evaluator to the computer system, so that the motion of the evaluator controls the motion of the virtual human in the virtual environment.

Claim 11.A method as set forth in claim 8 (Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1) wherein said step of preparing an evaluator includes providing the evaluator (Purschke: pg. 9, section 3.1) with a virtual reality display (Nayar: figures 1 and 3) mechanism operatively communicating with the computer system, for providing the evaluator a view of the virtual environment while evaluating the vehicle design.

Claim 12. A method as set forth in claim 8 (Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8 with section 3; and Purschke: pg. 9 figure 12, and section 3.1) preparing an adjustable property includes the step of determining a scale ratio range for a member of a target population (Nayar: pg 482, sections 1.4; and 3; specifically, right column, 2nd paragraph, last sentence) represented in the evaluation and using the scale ratio range to determine adjustability of the property.

Claim13. A method as set forth in claim 8(Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8 with section 3; and Purschke: pg. 9 figure 12, and section 3.1) including the step of determining whether to perform a new evaluation and performing a new evaluation if determined to perform a new evaluation.

Claim 14. A method as set forth in claim 8(Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8 with section 3; and Purschke: pg. 9 figure 12, and section 3.1) wherein said step of growing the virtual human includes the steps of: assuming an initial posture by

the evaluator; digitally establishing locations of motion capture sensors positioned on the evaluator in the initial posture using a computer system (Nayar: pg. 428, section 1.4, lines 7-8 with section 3); creating a virtual human digitally to represent the evaluator using the digital motion capture sensor locations for the virtual human, the evaluator's measurements and the scale ratio (Nayar: pg. 428, section 1.4, lines 7-8 with section 3); aligning the virtual human with the evaluator, wherein the motion capture sensor locations on the virtual human are aligned with the motion capture sensor locations on the evaluator's, and checking that the motion of the virtual human mirrors the motion of the evaluator (Nayar: pg. 428, section 1.4, lines 7-8 with section 3; with Purschke: pg. 11, lines 26).

Claim 15. A method of subjective evaluation of a vehicle design within a virtual environment using virtual reality, said method comprising the steps of: preparing an adjustable property to represent the vehicle design (Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1); measuring the evaluator (Nayar: pg. 428, section 3, left column, 2nd paragraph, lines 7-9); positioning a full-body motion capture system on an evaluator for sensing a motion of the evaluator and communicating the sensed motion of the evaluator to a computer system, so that the motion of the evaluator controls the motion of the virtual human in the virtual environment; providing the evaluator with a virtual reality display mechanism operatively communicating with the computer system, for providing the evaluator a view of the virtual environment while evaluating the vehicle design determining a scale ratio and

range of a target population for the evaluator wherein the scale ratio is a ratio between a predetermined dimension of the evaluator and a predetermined dimension of a member of a the target population (Nayar: pg. 428, section 1.4, and 3); adjusting the property using the scale ratio for the evaluator (Nayar: pg. 428, section 1.4, lines 7-8); growing the virtual human in the virtual environment using the measurements of the evaluator and the scale ratio to virtual represent a scaled evaluator(Nayar: pg. 428, section 3); aligning the virtual human in the virtual environment to the evaluator and the property; performing the evaluation of the vehicle design by the evaluator; and using the evaluation of the vehicle design in the desire of the vehicle (Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1).

Claim 16. A method as set forth in claim 15(Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1), including the step of determining whether to perform a new evaluation and performing a new evaluation if determined to perform a new evaluation (Nayar: pg. 428, section 3, right column, 1st paragraph).

Claim 17. A method as set forth in claim 16(Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1) including the step of determining whether to use a new evaluator and using a new evaluator if determined to use a new evaluator (Nayar: pg. 428, section 3, right column, 1st paragraph).

Claim 18. A method as set forth in claim 17 (Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1) including the step of determining whether to revise the scale ratio if determined not to use a new evaluator and revising the scale ratio if determined to revise the scale ratio (Nayar: pg. 428, section 3, right column, 1st paragraph).

Claim 19. A method as set forth in claim 15(Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1) wherein said step of growing the virtual human includes the steps of: assuming an initial posture by the evaluator; digitally establishing locations of motion capture sensors positioned on the evaluator in the initial posture using a computer system (Nayar: pg. 428, section 4, 3rd paragraph); creating a virtual human digitally using the motion capture sensor locations for the virtual human and the scaled measurements of the evaluator; aligning the virtual human with the evaluator, wherein the motion capture sensor locations on the virtual human are aligned with the motion capture sensor locations on the evaluator (Nayar: pg. 428, section 3 and 4 with Purschke: pg. 11, lines 25-26); and checking that the motion of the virtual human mirrors the motion of the evaluator (Purschke: pg. 11, lines 25-26).

Claim 20. A method as set forth in claim 15(Purschke: title; Nayar: pg. 428, section 1.4, lines 7-8; and Purschke: pg. 9 figure 12, and section 3.1), determining a scale ratio range for a member of a target population represented in the evaluation and using the

scale ratio range to determine adjustability of the property (Nayar: pg 482, sections 1.4; and 3; specifically, section 3, right column, 2nd paragraph, last sentence).

(10) Response to Argument

Claims 1 through 6

Appellants allege that Nayar fails to teach or mention a scaleable physical property representative of vehicle design adjusted to a scale ratio for an evaluator of the vehicle design (pg.9, 2nd paragraph). The Office directs the discussion to Nayar, page 428, section 1.4, to which the documents states the user's ability to create desired geometry and that the geometry "can be scaled down" (Nayar: pg. 428, section 1.4, line 8). The Office, in view this limitation within the context of the subject matter, believes there's no distinction between a "scale ratio" and "scaling down" of a 3D human image for, in this instance, to gage various human body shapes for a specified cliental (target population), to which the Nayar reference teaches (Nayar: pg. 428, section 3, "The Human Motion Programming Interface"). Furthermore, the Office further refutes this argument by stating the scaling ratio encompasses the entire process of modifying human body characteristics (Nayar pg. 428, section 3, right column, 1st paragraph): *The system only remembers postures that are explicitly stored by the user. A posture contains information regarding the joint values, attachments, and analysis. There is no limit to the number of postures in a motion sequence or the number of sequences attached to a worker. The interface also provides utilities to move forward and backward through postures for quick visual verification and editing of motion sequences.*

Appellants denote the combination of references lack motivation (pg.10, 2nd paragraph, last sentence) to which the Office would care to include addition motivation, stating from Purschke: "furthermore the user in an VE is able to choose every point he/she desires" (pg. 9, section 3.2. lines 1-2) .

Claims 8 through 14

As set forth in the rejection above, Nayar disclose the scaleable ratio limitation (appellants' arguments pg.14, lines 9-11 and lines 20-23; pg. 15, lines 12-20; pg. 16, 2nd & 3rd paragraphs).

In response to appellants' arguments against the references individually (specifically the Nayar reference, appellants' arguments, pg. 14, lines 9-11), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Appellants denote Nayar fails to teach or suggest the limitations of vehicle design, which is correct (page 14, lines 12-13; page 15, lines 12-18). However, Nayar and Purschke both teach a 3D CAD human-based software program which links two references together.

Claims 15-20

As set forth in the rejection above, Nayar disclose the scaleable ratio limitation (appellants arguments, pg. 18, 2nd paragraph; and pg.19, 2nd paragraph)

In response to appellants' arguments against the references individually (specifically the Nayar reference), one cannot show nonobviousness by attacking

references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Appellants denote the references lack of teach of a method for subjective evaluation of a vehicle design within a virtual environment using virtual reality includes the steps of the scale ratio and range of the target population for an evaluator (pg. 19, 2nd paragraph; also on page 20, lines 5-18). The Office directs the rebuttal to, first, the Purschke's abstract (line 1), stating, *"this article describes the use of a virtual reality techniques during the car development process at Volkswagen"* and secondly, Nayar (page 428, section 1.4; and section 3, right column, last paragraph, respectively) stating the *"existing geometry can be scaled down...During inverse kinematics, the redundant shoulder rotation is adjusted based on experimental results from neurophysiologic studies to put the elbow in a "natural" setting"* (highlights emphasized).

Appellants denote the Nayar design fails to teach vehicle design to which the appellants are correct (page 19, 3rd paragraph). However, the combination of Nayar with Purschke encompasses this limitation to which Nayar teaches ergonomic properties but not for automotive applications to which Purschke teaches (appellants' arguments: pg.20, lines 5-18). To reiterate, Nayar and Purschke both teach 3D CAD human-based software program that links the two references together.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Thomas H. Stevens

Examiner

Art Unit 2123

LEO PICARD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

Conferees:

Leo Picard

Anthony Knight